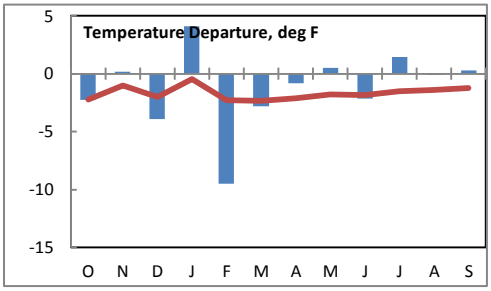
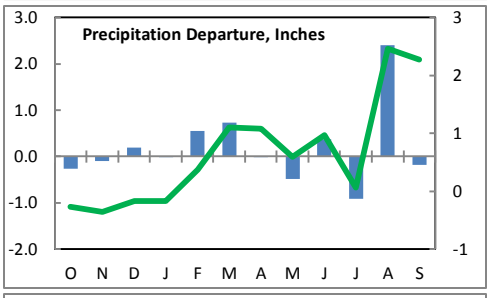
Montana Weather/Precipitation Summary

September 2014 by NOAA's National Weather Service Great Falls Montana

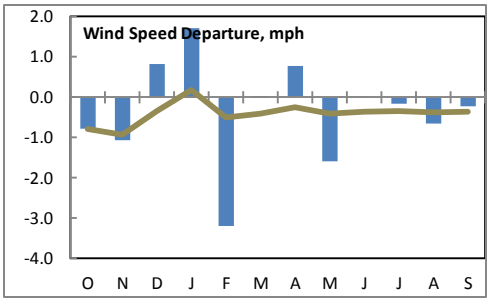
Temperatures averaged a few degrees either side of normal across the state in September. Normally, flow aloft averages almost due westerly this month. There was a slightly stronger than normal ridge, with west-northwest flow aloft.

Statewide composite temperatures averaged 0.3°F above normal for the month. Figure 2 shows the areas of temperature anomalies. The greatest negative anomaly of 1.9°F was at Gold Butte, while the greatest positive departure was at Heron, 2.1°F above normal. The warmest average monthly temperature was 61.3°F at Broadus, and the coolest was 44.1°F at Placer Basin. For the past 12-months, the statewide composite average temperature is 1.2°F below normal. Seven of the past 12 months have recorded temperature averages below normal.

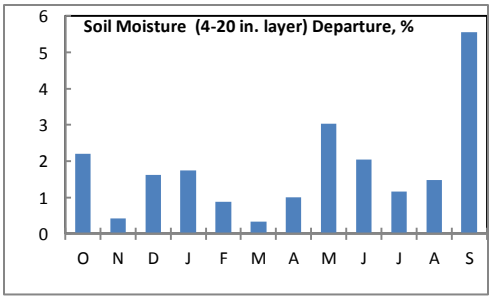




The monthly departure from normal for precipitation across Montana is shown in Figure 3. Below normal conditions prevailed in the east and west, with a band of above normal precipitation from the southwest through north central. The highest amount was 2.82 inches near Absarokee. Overall, September averaged 0.98-inches, or 0.18-inches below normal. The statewide composite precipitation for the past 12 months is 2.28-inches above normal.



On a statewide basis, winds averaged below normal this month. This was the 14th calmest September of record. The statewide composite average was 7.8 mph (0.2-mph below normal), with the 12-month average running 0.4-mph below average. The fastest average speed was 13.9 mph at Logan Pass, while Sweet Grass recorded an average of 11.8 mph. The fastest measured gust of the month, 72 mph, occurred at Deep Creek RAWS on the 19th.



While soils in some areas of the west began to dry out in September, overall the soil moisture conditions were the best of record for this month. The September values were 5.6 points above normal. The last year with values nearest this years' was in 2010.

Refer to NCDC's State of the Climate report for the latest monthly discussion: http://www.ncdc.noaa.gov/sotc/.

Sep 1 – 14

Generally cooler than normal temperatures prevailed for the first one-half of September. Thunderstorms in eastern Montana produced half-dollar size hail in Daniels County on the third, while wind gusts reached 67 mph at Bredette (Roosevelt). A strong cold air mass pushed southward across the state on the 9th-11th. The first snow of the season fell at many locations. At Great Falls, snow fell on the 9th, which was the earliest snowfall since 1992 and the fourth earliest of record. On the 10th, Cut Bank's temperature rose to only 36°F, a record cool maximum temperature for the date. Snowfall totals from the 10th and 11th included 3.5-inches at Park City, 4-inches at Two Dot, six inches at Zortman and 7" at Polebridge. Five to 10 inches fell across the

Glacier area. On the 12th, Wisdom fell to 7°F. This was their coldest so early in the season and their first sub 10°F reading of the year. Several record low temperatures were set across western Montana, including 25°F at Missoula and 23°F at Kalispell.

Sep 15 - 30
The last one-half of the month saw generally above normal temperatures. The highest temperature of the month occurred on the 25th, when several locations reached 98°F. Though warm, this was not a record for the date. In 2001, Fort Benton reached 100°F on September 25. With the warmth, generally dry conditions also prevailed. A storm system brought some rain and small hail to Park County on the 18th. On the 27th, a strong cold front brought cooler air and precipitation to the state once again. Another round of light precipitation occurred on the 30th.

Precipitation/convection

Severe convective weather occurred on zero days in September. Normal for September is 1 day. For the severe season through September, severe weather was reported on 38 days across Montana. This is one day fewer than normal.

Water Year (October 2013 – September 2014)
For this water year, temperatures averaged 42.0°F, or 1.3°F below normal. This was the coolest water year since 2011, and the 33rd coolest of record. Heavier than normal precipitation in December, February, March and August pushed the composite precipitation total to 17.48", 2.30 inches above normal. This was the 19th wettest water year of record. Winds averaged at or below normal for seven of the twelve months, making the average for the period 8.9 mph, 0.3-mph below normal. This was the 21st calmest water year of record.

September summary information:

High Temperature	98°F near Powderville, Mizpah, Terry and Loma (25th)	**Greatest Precip**	2.82" near Absarokee
Low Temperature	7°F at Wisdom (12th)		4.10" at Brackett Creek SNOTEL
Warmest Ave Temp	61.8°F at Broadus	**Peak Wind Gust**	72 mph at Deep Creek RAWS (19th)
Coolest Ave Temp	44.1°F at Placer Basin		
Range of Temp departures	-1.9°F at Gold Butte to +2.9°F at West Glacier	**Highest Ave Wind**	11.8 mph at Sweet Grass 13.9 mph at Deep Creek
21 city mean monthly Temperature/Normal	56.4/56.1F 0.3F above normal. 62nd warmest of record (since 1880). 54th percentile. Oct-Sep 42.0/43.2 1.2F below normal. 33rd coolest of record.	**20 city mean monthly wind speed/Normal**	7.8 mph/8.0 mph; 14th calmest of record (since 1936). 19th percentile. Oct-Sep 8.9 mph/9.2 0.3-mph below normal. 21st calmest of record.
22 city mean monthly precipitation/Normal	0.98/1.16" – 84% of normal. 57th driest of record (since 1880). 42nd percentile Oct-Sep 17.48"/15.18" – 2.30" above normal. 19th wettest of record.		

Historical Rank of Precipitation (inches)
for the Current Month and Water Year to Date

Location	Sep	% of Norm	Rank	Pcntl	Oct 1 – Sep 30	% of norm	Rank	Pcntl	Years
Baker	1.11	97%			16.76	144%			16
Billings	0.57	43%	37	32	17.35	117%	93	84	110
Belgrade	1.30	118%	43	55	15.32	109%	59	76	77
Butte	0.97	97%	59	48	13.48	106%	71	59	119
Cut Bank	1.07	88%	65	60	15.67	144%	93	88	106
Dillon	0.86	102%	37	49	10.22	97%	43	58	74
Glasgow	0.80	85%	67	56	15.20	130%	88	77	114
Great Falls	0.72	51%	37	30	19.23	130%	107	88	122
Havre	0.84	75%	65	48	13.17	118%	86	64	134
Helena	1.10	100%	78	57	10.96	98%	63	46	136
Jordan	0.64	53%			14.94	118%			16
Kalispell	1.14	83%	61	50	19.93	117%	108	90	120
Lewistown	1.49	110%	64	53	18.65	111%	73	62	118
Livingston	1.73	143%	77	68	16.54	112%	75	70	106
Miles City	0.29	27%	26	18	13.96	112%	86	63	137
Missoula	0.28	24%	15	10	12.01	84%	36	28	128
Mullan Pass	0.92	58%	20	26	45.74	120%	57	79	72
Wolf Point	0.35	35%			13.34	110%			16
Glendive	0.41	32%	37	31	19.99	147%	101	92	110
Sidney	1.02	82%	39	52	14.49	101%	45	61	73
BZN-MSU	1.61	115%	77	56	21.62	110%	104	82	127

Rankings and Percentiles are 1=driest, higher numbers=wetter.
For an automated version of this chart, updated daily, go to
http://www.wrh.noaa.gov/tfx/dx.php?wfo=tfx&type=&loc=products&fx=PCPNTOTALS

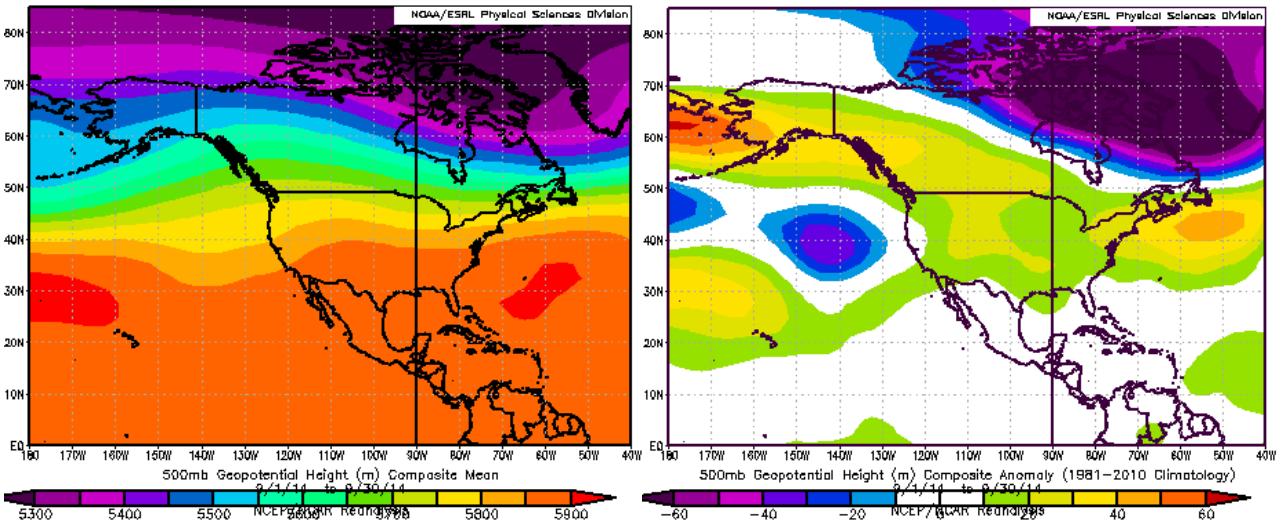


Figure 1. Mean flow at 500 millibars (~18,000 ft) for this month (top-left) and departure from normal (top-right).

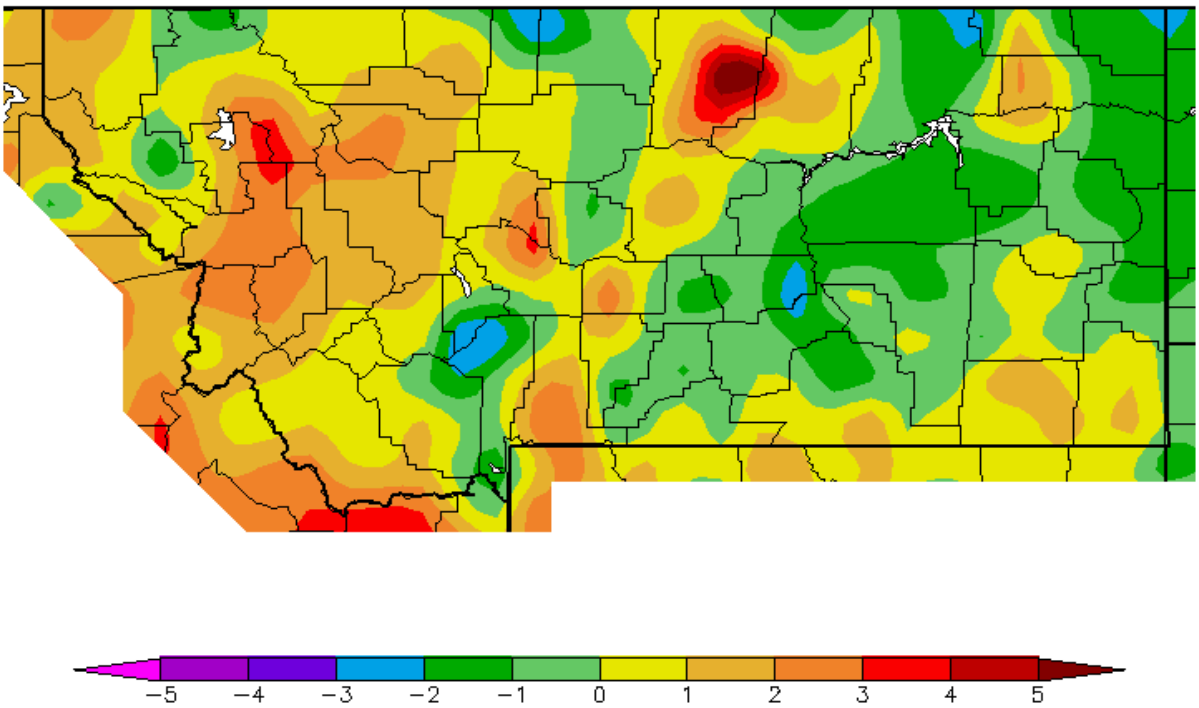


Figure 2. September 2014 temperature departures from normal (°F) (Western Region Climate Center).

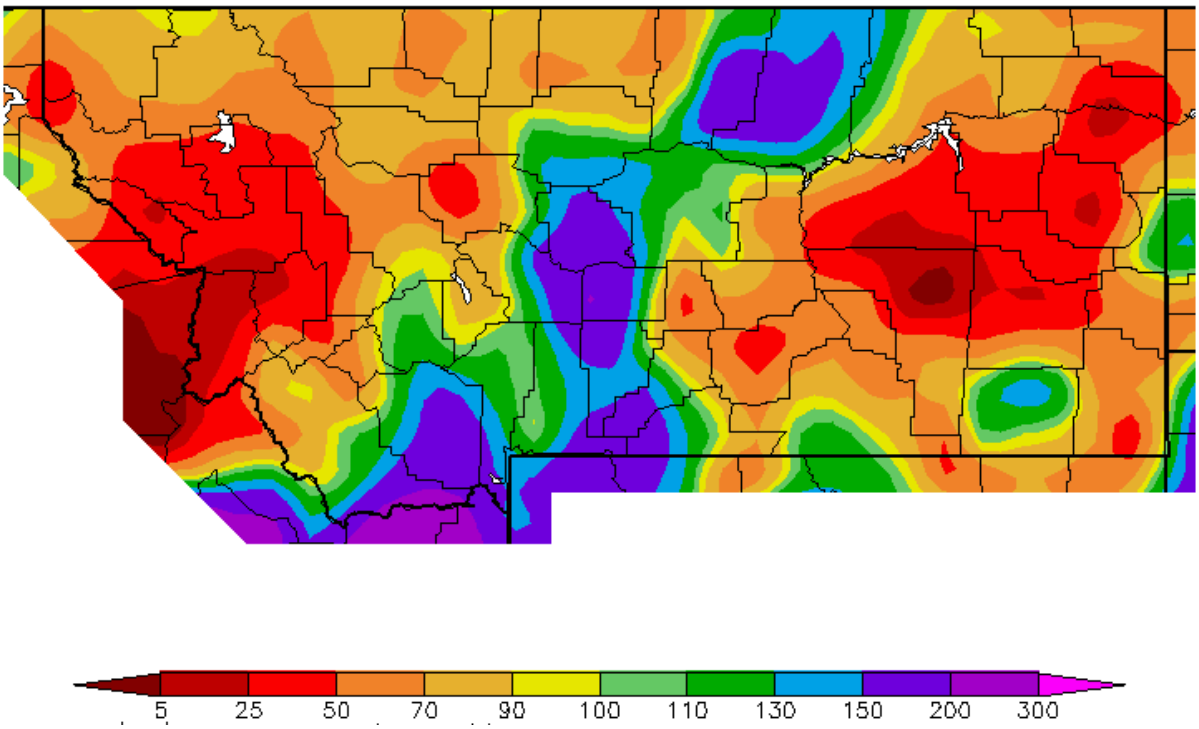


Figure 3. September 2014 precipitation departures from normal (percent) (Western Region Climate Center).

For a state map of % of normal water year precipitation (updated around the 7th of each month), go to: http://www.wrh.noaa.gov/tfx/climate/monthlysum/climatesum.php?wfo=tfx

For the latest information on mountain snowpack from the NRCS, go to: http://www3.wcc.nrcs.usda.gov/snow/index.html

For the latest U.S. Drought Monitor, issued weekly by the National Drought Mitigation Center, USDA and NOAA, go to: http://droughtmonitor.unl.edu/

These data are preliminary and have not undergone final QC by NCDC. Therefore, these data are subject to revision. Final and certified climate data can be access at the National Climatic Data Center (NCDC) http://www.ncdc.noaa.gov. Many more links are on the Drought Information Page of the NWS Great Falls web site at http://www.wrh.noaa.gov/tfx/main/drought.php?wfo=tfx. The climatological record for normals is 1981-2010. The ranking period for temperature, precipitation and snowfall is since 1880. The ranking period for wind speeds is since 1936. The ranking period for soil moisture is since 1995.